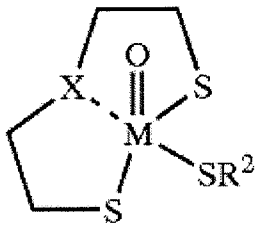
Amendments to the Claims

The following listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of the Claims:

1. (withdrawn and currently amended) A compound having the formula I



wherein

M is ~~a radionuclide~~ ^{99m}Tc, ^{186}Re, or ^{188}Re;

X is ~~oxygen, sulfur, or~~ NR^1 wherein R^1 is $CH_2CH_2NEt_2$ or $CH_2CH_2CH_2CH_3$; and

R^2 is $CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2NEt_2)$ or $CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2CH_2CH_3)$.

~~R^1 and R^2 are, independently, an alkyl group, a cycloalkyl group, a heterocycloalkyl group, an alkenyl group, an alkynyl group, an aryl group, a heteroaryl group, an aralkyl group, or a combination thereof, wherein R^1 and R^2 can be substituted with one or more groups comprising an alkoxy group, a hydroxy group, an amine group, a thio group, an amide, an ester, a carbonate group, a carboxylic acid, an aldehyde, a keto group, an ether group, a halide, a urethane group, a silyl group, or a sulfo-oxo group.~~

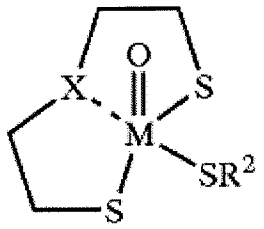
Claims 2-9 (cancelled)

10. (withdrawn and currently amended) The compound of claim 1, wherein ~~X is NR^1;~~ R^1 is $CH_2CH_2NEt_2$[[,]] and R^2 is $CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2NEt_2)$~~, and M is ^{99}mTc, ^{186}Re or ^{188}Re~~.

11. (withdrawn and currently amended) The compound of claim 1, wherein ~~X is R^1;~~ R^1 is

$CH_2CH_2CH_2CH_3$[[,]] and R^2 is $CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2CH_2CH_3)$~~, and M is ^{99}mTc, ^{186}Re or ^{188}Re~~.

12. (currently amended) A radiolabeled liposome comprising a liposome and a compound having the formula I



wherein

M is ~~a radionuclide~~ ^{99m}Tc, ^{186}Re, or ^{188}Re;

X is ~~oxygen, sulfur, or~~ NR^1 wherein R^1 is $CH_2CH_2NEt_2$ or $CH_2CH_2CH_2CH_3$; and

R^2 is $CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2NEt_2)$ or
$CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2CH_2CH_3)$.

~~R^1 and R^2 are, independently, an alkyl group, a cycloalkyl group, a heterocycloalkyl group, an alkenyl group, an alkynyl group, an aryl group, a heteroaryl group, an aralkyl group, or a combination thereof, wherein R^1 and R^2 can be substituted with one or more groups comprising an alkoxy group, a hydroxy group, an amine group, a thio group, an amide, an ester, a carbonate group, a carboxylic acid, an aldehyde, a keto group, an ether group, a halide, a urethane group, a silyl group, or a sulfo-oxo group,~~

wherein the compound is incorporated or attached to the liposome.

13. (original) The radiolabeled liposome of claim 12, wherein the liposome further comprises a drug that is incorporated within the liposome.

14. (original) The radiolabeled liposome of claim 13, wherein the drug is a compound comprising at least one thiol group.

15. (original) The radiolabled liposome of claim 14, wherein the drug reacts with the

compound having the formula I.

16. (original) The radiolabeled liposome of claim 13, wherein the drug comprises glutathione, cysteine, N-acetyl cysteine, 2-mercaptosuccinic acid, 2,3-dimercaptosuccinic acid, captopril or a combination thereof.

17. (original) The radiolabeled liposome of claim 12, wherein the liposome comprises a lipid.

18. (original) The radiolabeled liposome of claim 12, wherein the liposome comprises a phospholipid.

19. (original) The radiolabeled liposome of claim 12, wherein the liposome comprises a cholesterol or a cholesterol analogue.

20. (original) The radiolabeled liposome of claim 18, wherein the liposome comprises distearoyl phosphatidylcholine.

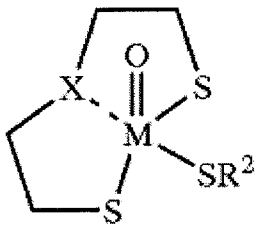
21. (original) The radiolabeled liposome of claim 12, wherein the amount of radionuclide attached or incorporated into the liposome is from about 0.0 1 mCi to about 400 mCi per 50 mg of lipid that is used to prepare the liposome.

22. (original) The radiolabeled liposome of claim 12, wherein the liposome further comprises a chemotherapeutic agent, an antibiotic agent or a treatment molecule, wherein the chemotherapeutic agent, the antibiotic agent, or the treatment molecule is incorporated or attached to the liposome.

23. (withdrawn and currently amended) A method of making a radiolabeled liposome, comprising mixing

a. a liposome having an outer space and an inner volume, wherein the pH of the inner volume of the liposome is less than the pH of the outer space of the liposome, with

b. a compound having the formula I



wherein

M is ~~a radionuclide~~ ^{99m}Tc, ^{186}Re, or ^{188}Re;

X is ~~oxygen, sulfur, or~~ NR^1 wherein R^1 is $CH_2CH_2NEt_2$ or $CH_2CH_2CH_2CH_3$; and

R^2 is $CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2NEt_2)$ or
$CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2CH_2CH_3)$,

~~R^1 and R^2 are, independently, an alkyl group, a cycloalkyl group, a heterocycloalkyl group, an alkenyl group, an alkynyl group, an aryl group, a heteroaryl group, an aralkyl group, or a combination thereof, wherein R^1 and R^2 can be substituted with one or more groups comprising an alkoxy group, a hydroxy group, an amine group, a thio group, an amide, an ester, a carbonate group, a carboxylic acid, an aldehyde, a keto group, an ether group, a halide, a urethane group, a silyl group, or a sulfo-oxo group,~~

wherein after components (a) and (b) are mixed, the compound is incorporated or attached to the liposome.

24. (withdrawn) The method of claim 23, wherein the pH of the inner volume of the liposome is acidic and the pH of the outer space of the liposome is neutral, basic, or a physiological pH.

25. (withdrawn) The method of claim 23, wherein the inner volume of the liposome contains a compound comprising at least one amine group or at least one carboxyl group.

26. (withdrawn) The method of claim 23, wherein the inner volume of the liposome contains ammonium sulfate.

27. (withdrawn) The method of claim 23, wherein the pH of the inner volume is from about

4 to about 7 and the pH of the outer space is from about 6 to about 7.4.

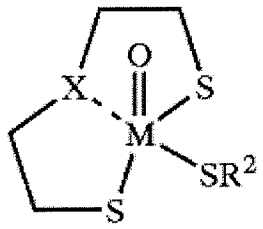
28. (withdrawn and currently amended) The method of claim 23, wherein after the liposome and the compound having the formula I are mixed, the radiolabeled liposome is incubated at from 25°C[[.]] to 37°C[[.]] for 0.5 to 2 hours.

29. (withdrawn) The radiolabeled liposome produced by the method of claim 23.

30. (withdrawn and currently amended) A method of making a radiolabeled liposome, comprising mixing

a. a liposome having an outer space and an inner volume, wherein a drug comprising at least one thiol group is incorporated within the inner volume of the liposome, with

b. a compound having the formula I



wherein

M is ~~a radionuclide~~ ^{99m}Tc, ^{186}Re, or ^{188}Re;

X is ~~oxygen, sulfur, or~~ NR^1 wherein R^1 is $CH_2CH_2NEt_2$ or $CH_2CH_2CH_2CH_3$; and

R^2 is $CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2NEt_2)$ or
$CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2CH_2CH_3)$,

~~R^1 and R^2 are, independently, an alkyl group, a cycloalkyl group, a heterocycloalkyl group, an alkenyl group, an alkynyl group, an aryl group, a heteroaryl group, an aralkyl group, or a combination thereof, wherein R^1 and R^2 can be substituted with one or more groups comprising an alkoxy group, a hydroxy group, an amine group, a thio group, an amide, an ester, a carbonate group, a carboxylic acid, an aldehyde, a keto group, an ether group, a halide, a urethane group, a silyl group,~~

~~or a sulfo-oxo group,~~

wherein after components (a) and (b) are mixed, the compound is incorporated into the liposome.

31. (withdrawn) The method of claim 30, wherein the drug reacts with the compound having the formula I.

32. (withdrawn) The method of claim 30, wherein the drug comprises glutathione, cysteine, N-acetyl cysteine, or a combination thereof.

33. (withdrawn and currently amended) The method of claim 30, wherein after the liposome and the compound having the formula I are mixed, the radiolabeled liposome is incubated at from 25°C[[.]] to 37°C[[.]] for 0.5 to 2 hours.

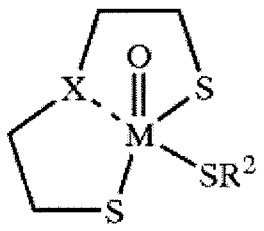
34. (withdrawn) A radiolabeled liposome made by the method of claim 30.

Claims 35-39 (cancelled)

40. (withdrawn and currently amended) A kit comprising

a. a liposome having an outer space and an inner volume, wherein the pH of the inner volume of the liposome is less than the pH of the outer space of the liposome, and

b. a compound having the formula I



wherein

M is ~~a radionuclide~~ ^{99m}Tc, ^{186}Re, or ^{188}Re;

X is ~~oxygen, sulfur, or~~ NR^1 wherein R^1 is $CH_2CH_2NEt_2$ or $CH_2CH_2CH_2CH_3$; and

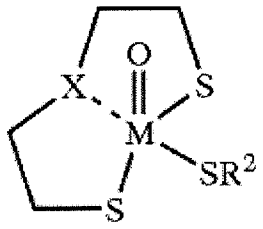
R^2 is $CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2NEt_2)$ or
$CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2CH_2CH_3)$.

~~R^1 and R^2 are, independently, an alkyl group, a cycloalkyl group, a heterocycloalkyl group, an alkenyl group, an alkynyl group, an aryl group, a heteroaryl group, an aralkyl group, or a combination thereof, wherein R^1 and R^2 can be substituted with one or more groups comprising an alkoxy group, a hydroxy group, an amine group, a thio group, an amide, an ester, a carbonate group, a carboxylic acid, an aldehyde, a keto group, an ether group, a halide, a urethane group, a silyl group, or a sulfo-oxo group.~~

41. (withdrawn and currently amended) A kit comprising

a. a liposome having an outer space and an inner volume, wherein a drug comprising at least one thiol group is incorporated within the inner volume of the liposome, and

b. a compound having the formula I



wherein

M is ~~a radionuclide~~ ^{99m}Tc, ^{186}Re, or ^{188}Re;

X is ~~oxygen, sulfur, or~~ NR^1 wherein R^1 is $CH_2CH_2NEt_2$ or $CH_2CH_2CH_2CH_3$; and

R^2 is $CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2NEt_2)$ or
$CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2CH_2CH_3)$.

~~R^1 and R^2 are, independently, an alkyl group, a cycloalkyl group, a heterocycloalkyl group, an alkenyl group, an alkynyl group, an aryl group, a heteroaryl group, an aralkyl group, or a combination thereof, wherein R^1 and R^2 can be substituted~~

~~with one or more groups comprising an alkoxy group, a hydroxy group, an amine group, a thio group, an amide, an ester, a carbonate group, a carboxylic acid, an aldehyde, a keto group, an ether group, a halide, a urethane group, a silyl group, or a sulfo-oxo group.~~

42. (new) The radiolabeled liposome of claim 12, wherein R^1 is $CH_2CH_2NEt_2$ and R^2 is $CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2NEt_2)$.

43. (withdrawn and new) The method of claim 23, wherein R^1 is $CH_2CH_2NEt_2$ and R^2 is $CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2NEt_2)$.

44. (withdrawn and new) The method of claim 30, wherein R^1 is $CH_2CH_2NEt_2$ and R^2 is $CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2NEt_2)$.

45. (withdrawn and new) The method of claim 34, wherein R^1 is $CH_2CH_2NEt_2$ and R^2 is $CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2NEt_2)$.

46. (withdrawn and new) The kit of claim 40, wherein R^1 is $CH_2CH_2NEt_2$ and R^2 is $CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2NEt_2)$.

47. (withdrawn and new) The kit of claim 41, wherein R^1 is $CH_2CH_2NEt_2$ and R^2 is $CH_2CH_2N(CH_2CH_2SH)(CH_2CH_2NEt_2)$.